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ABSTRACT

These reports comprise sample collections of experimental instructional projects seeking new and better arrangements for teaching. The entries in section one, describe department-based projects in accounting, art history, biology, botany, business administration, communication, counseling, dairy science, design, education, engineering, language, mathematics, microbiology, physical therapy, political science, psychology, and statistics. Section two includes descriptions of institutional facilities, instructional media arrangements and broad programs that span different disciplines. Section three is a cumulative index to this and eight previous reports. A content analysis of the first eight reports is included. (Author/AJM)

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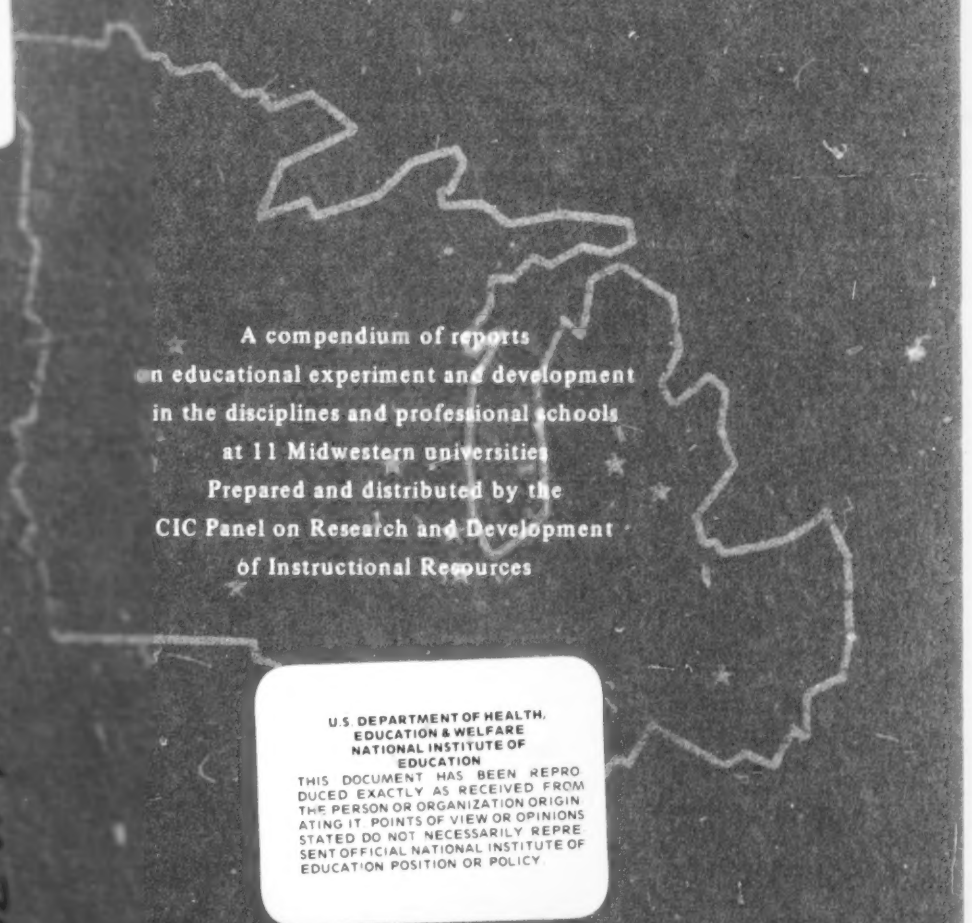
Development and Experiment In College Teaching



A compendium of reports
on educational experiment and development
in the disciplines and professional schools
at 11 Midwestern universities
Prepared and distributed by the
CIC Panel on Research and Development
of Instructional Resources

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REPORT No. 9 SPRING 1973

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The Committee on Institutional Cooperation (CIC) was established in 1959 by the Big Ten Universities and the University of Chicago to facilitate pooling of resources and talents on matters of mutual concern in higher education.

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Development and Experiment in College Teaching

No. 9*
Spring 1973

University Representatives
Panel on Research and Development
of Instructional Resources

* Includes Content Analysis of Issues 1–8

Foreword

These reports comprise sample collections of experimental instructional projects seeking new and better arrangements for teaching. Their purpose is served if they provide a useful exchange of information among college teachers, administrators, and educational researchers. The projects are usually aimed at improving the conditions for learning in a specific subject-matter area, but many of the reported procedures can be adapted for use in other departments. The current issue (Report #9) gives special emphasis to student participation in the instructional process. Also, several earlier abstracts are "revisited" as confirmation of successful programs.

The entries in Section I, Subject-Matter Areas, describe department-based projects. Section II, University-Wide Activities, includes descriptions of institutional facilities, instructional media arrangements, and broad programs which span different disciplines. Section III is the Cumulative Index to all nine reports. A former index (IV, Cumulative Index by Category) has been replaced in this issue by a content analysis of the first eight reports.

Copies of all reports are available without charge to faculty members of CIC institutions and should be requested directly from institution representatives (see p. iv). To all others, copies are available from the address below at a cost of $1.00 each. This publication is not copyrighted and teachers and administrators are encouraged to make free use of the material.

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I. Subject-Matter Area

ACCOUNTING

Self-Instruction via Text and Tapes

Accounting I and II are no longer taught in the traditional classroom setting at Indiana University's Division of General and Technical Studies at Fort Wayne. Each course is now taught by means of a text, a 200-page manual, and a series of cassette tapes.

Students are permitted to register throughout the year and proceed at their own rate. The Accounting laboratory is open 48 hours per week and is always staffed by faculty and/or graduate assistants to aid students and to administer quizzes and examinations.

Trends over the past several semesters which are encouraging are:

a) The flexibility of matching each student's learning rate with his professional goals. The time to complete a course has ranged from 11 weeks to 24 weeks.

b) Students receiving "D" or "F" have been reduced 19%.

c) Students receiving "Incomplete" have been increased 25%, but 22% of these have remained in the course and are completing it at a slower rate, finally achieving a grade of "C" or better. Thus, more students are succeeding.

This self-instruction approach has allowed the achiever to proceed toward his goals at a faster rate; the slower learner does not get discouraged and drop the course as readily, but continues at a slower rate; and student registration and retention have been increased.

For further information contact: Dr. Carl Bickley, Dean, or Mrs. Thelma Mitchell, Program Director, Indiana University, Division of General and Technical Studies, 1120 South Barr Street, Fort Wayne, Indiana 46802.

ART HISTORY

New Approaches to Teaching Art History: A Follow-Up

Since 1970 members of the Art History faculty have been working with the Programmed Learning Center and the Human Learning Center at the University of Minnesota to devise new systems for teaching the large undergraduate surveys in Art History. A report of the pilot testing of materials and techniques was included in CIC Report #7 (1971, p.3), and their use in an introductory survey course was reported the following year (CIC #8, 1972, p.3). Through a seminar, faculty from the Art History Department and the two Centers established objectives and performance criteria which reflected both faculty and student expectations for the courses, and a systematic approach to the problems of teaching and learning. Attention was focused primarily on the performance of individual students. The aim has been to combat the problems that arise from the traditional method of teaching large numbers of students in a lecture course--problems caused by the fixed pace of the lectures and their passive approach to learning, and the lack of direct contact between student and teacher.

Printed materials in the form of syllabi, handouts containing instructions and explanations of terminology, exercises, and evaluations of the students' progress are distributed to the students. The lecture material of the Ancient and Medieval surveys is now presented to the students by means of short (15-30 minute) tapes synchronized with slides. The tapes are accessible to the students for long periods of time, thus allowing them to work at their own pace and if necessary to play each tape several times. The teacher and teaching assistants are available to discuss problems with individual students and to grade exercises which test the students' understanding at frequent intervals in the course.

The Ancient survey was tested in 1970-71 and in 1971-72 with volunteers. In each case the new course was offered as an alternative to the regular lecture course in Ancient Art. In 1972-73 the new course is offered without an alternative. The Medieval Art survey was also tested as an alternative to the lecture course and is now taught without an alternative. Student reaction so far has been both positive and encouraging. Further research and improvements are now being carried out on the basis of the information collected from these experiments. Plans are to extend this approach to other areas of Art History.

For further information contact: Professor S. McNally and Professor M. A. Stones, Department of Art History, University of Minnesota, Minneapolis, Minnesota 55455.

BIOLOGY

Undergraduate Research Participation

Undergraduate student opportunities for meaningful self-directed participation in the biological research efforts of Michigan State University tend to be very limited. While most biological departments have a "Special Problems" course, the time available (usually one semester) and degree of commitment of both faculty and students to this program are restricted. Budgetary considerations within a given laboratory may also preclude otherwise useful lines of investigation by students, and the small amount of time usually allotted often requires that the results of the investigation be viewed with indulgence on the part of the faculty and trepidation by the students.

To alleviate this problem, it was proposed that selected upperclass students do personal research projects in a faculty research laboratory for three quarters, and present their results in thesis form. In the experimental stage, 15 students were carefully screened and faculty sponsors selected on the basis of mutual interests. Students conducted research in the faculty's lab facility. They did not receive direct aid or fixed dollar amounts, but supplemental funds for small equipment and laboratory supplies were available when needed.

The project appeared highly successful in its first year of operation and is being continued. Student and faculty questionnaires indicated excitement over the types of research which were conducted and appreciation on the part of the students of the opportunity to direct their own learning efforts. All theses were written and defended orally in front of a faculty committee. There was no question that the quality of work was extremely high and the learning largely improved over the conventional senior courses.

For further information contact: Dr. Stephen C. Bromley, 141 Natural Science Building, Michigan State University, East Lansing, Michigan 48823.

BOTANY

Audio-Tutorial Instruction Revisited: Mini-Course Credits

Eleven years ago an "audio-tutorial" system for teaching introductory botany was initiated at Purdue (see CIC Report #1, p.3). The system provides for individualized conditions and rates of learning, retains those traditional methods which clearly serve educational purposes, and uses a mixture but yet a minimum of technological hardware. Continuity and guidance of learning are provided by conversational-style audio tape recordings.

Perhaps the most noteworthy fact about the system is that it is an innovation which remains effective and viable after more than a decade. It has been copied and adapted, it has spread to other colleges and universities and has even reached into the lower schools, and it is represented on a more-than-token basis internationally. In general, it has been well received--and effective for--students. In addition, it is an innovation which fits easily within the skills and material resources of a teacher and his department or school. It can be initiated modestly and inexpensively; advanced and refined materials or techniques can be added as the need arises and the resources become available.

Recently, "mini-courses" have been developed (described in CIC Report #8, p.4). These have grown naturally from the freedom which audio-tutorial teaching provides and from dissatisfaction with the arbitrariness inherent in traditional views of course content or "coverage." The mini-course alternative recognizes that many intellectual interests and learnable skills can be accommodated in sequences and in groupings or "bundles" which allow more choice. Students can get instruction on a "need-to-know" basis and may uniquely sequence several mini-courses.

A complication of this stems from institutional customs in granting credits. What does a student do with, say, 1.75 credits earned from several mini-courses? This question is now receiving attention, and several alternatives for resolving the problem are being considered.

For further information contact: Professor S. N. Postlethwait, Department of Biological Sciences, Purdue University, West Lafayette, Indiana 47907.

BUSINESS ADMINISTRATION

Practical Experience in Business Administration

Recently, the College of Business of Michigan State University was asked by several agencies in the Lansing business community to provide consulting help in regard to economical redevelopment of the inner city. In response, the College developed a three-term sequence for seniors in business administration. Students taking part in the program were able to apply knowledge and skills acquired in the classroom in a self-directed manner and, at the same time, provide managerial assistance to local small businessmen in cooperation with the Lansing Model Cities Program. The course sequence focuses primarily on problems of establishing, financing and managing small business enterprises within the Model Cities geographic area. The entire experimental student internship program is known as LEASE, the Lansing Entrepreneurial Assistance Service.

During the first term of the experimental program, students received intensive problem-solving training involving lectures, discussions, guest speakers, and role-playing simulation, including video tape feedback. The purpose of these classroom experiments was to provide students with conceptual interpersonal skills required for counseling with small businessmen. Students also developed a simulated proposal to be submitted to the small business agencies.

In the following two terms, students were divided into three interdisciplinary teams and assigned to assist small businesses in the Lansing area. Student teams met with the assigned client once a week, then met with MSU business staff to discuss each case. Teams made weekly progress reports and, to a large extent, were free to develop their own solutions to problems encountered.

By the end of the third term, students had completed a 20-week counseling experience. A written final exam was given, and students were asked for a written evaluation of their experience--and encouraged to suggest alternative procedures which might be used.

Using student attitudinal data and final exam scores as measures, the project was assessed to be very successful. Students obtained more in-depth counseling experience with clients of differing backgrounds than could ordinarily be obtained in a college curriculum. Faculty who participated in the course and Model Cities staff were in unanimous agreement that the course and its effect on the clients were very beneficial. The course has now been integrated as a permanent part of the business curriculum.

For further information contact: Mr. David Hill, College of Business, 432 Eppley Center, Michigan State University, East Lansing, Michigan 48823.

COMMUNICATION

Using VTR to Test Film Scripts

Students in film production classes in the Department of Communication at Purdue University write original film scripts to accompany their own film footage. There is a need for an inexpensive method for students to test their scripts by reading the narration and inserting sound effects while watching the film. Through experimentation it was discovered that several low-cost "nonprofessional" 1/2-inch video tape recorders with "high persistence" vidicon tubes can be used to record motion picture film with a minimum of picture "flicker" and without apparent "shutter bars."

A 16mm, 8mm, or Super 8mm motion picture projector is used to project the film on a white screen. Any projector speed can be used. The VTR camera is aimed at the projected film image. The narrator is placed at a distance or isolated from the noise of the running projector. The projector and the VTR are turned on, and the student records his sound track while viewing the picture on the screen or monitor. The taped results can be immediately viewed and evaluated by the student, the teacher and other members of the class. In addition, problems of telecast film cropping, picture detail loss, and contrast changes that occur in professional telecasting are apparent on the "nonprofessional" tape playback. This technique is best used with films made by participants. It should not be used to illegally record copyrighted films.

For further information contact: Professor Karl Lohmann, Jr., Department of Communication, Purdue University, Lafayette, Indiana 47907.

COUNSELING

Status Report on the UWM Computerized Guidance Programs

The University of Wisconsin - Milwaukee (UWM) Computerized Guidance Programs are presently in their third stage and finishing their fifth year of development. The first stage of development (begun late in the Fall of 1967) consisted of identifying areas and planning the programs. The following areas were identified: 1. Computer Assist Counseling--for teaching delinquents and potential delinquents what the mainstream of society expected. 2. Computerized Decision Development System--a progressive series of programs, each involving theory presentation followed by gaming and simulation to use theory, for developing decision making competency in

individuals. 3. Milwaukee Educational Guidance System--for purposes of student orientation and planning relative to post-high school learning opportunities. 4. Milwaukee Computerized Vocational Guidance System--for career orientation and planning, and for developing vocational maturity in secondary school youth. 5. Programmed Learning Unit on Drug Abuse Education--for use in teaching students what they really want to know about drug abuse education. 6. Computerized Case Study Analysis--computerized case studies for use in university instructional programs, for counselor practicum, and school psychology practicum, etc.

The second phase of this study involved the development of programs and computer programming to accommodate such activity. Two of these programs, Computer Assist Counseling and Programmed Learning Unit on Drug Abuse Education, were described in CIC Report #6 (p.4). This stage also involved the forging of economic efficiency in the operation of such programs, which was accomplished largely through a series of micro-programming. The third and present phase of the program is concerned with functionalizing the programs; with the integration of the six programs into a meaningful guidance system; and with maximizing the use of the computer for operational use instructions. It involves the operational use of these programs, and the necessary "debugging" to make such use feasible. The fourth phase of the program is planned for expanded development, and to include an ongoing evaluation of a systematical type.

For further information contact: Russell N. Cassel, Department of Educational Psychology, University of Wisconsin-Milwaukee, Milwaukee, Wisconsin 53201.

DAIRY SCIENCE

Non-Pasteurized Learning

In a graduate level Dairy Science course, Physiology of the Mammalian Germ Cells, the students chose an experimental method rather than the conventional lecture presentation method. The students determined the subject matter to be covered, arranged the strategy for dealing with content, and implemented their plan.

At the first class session, the students discussed ideas concerning the content objectives of the course. They attempted to outline the major subdivisions of the topic which ought to be covered if the educational objectives were to be met. The students then selected a procedure which would spread each student's burden of preparation evenly throughout the quarter. In their opinion, this could best be achieved by dividing into three or four man teams which would deal with the content for a given week. Each student was to be involved in preparing at least three portions of three major

subjects scattered throughout the quarter. Student teams selected a subject matter coordinator, and met to determine the subdivision of work. To avoid redundancy, the team prepared an outline which was presented to the class one week prior to their scheduled presentation.

The first 45 minutes of the two-hour period were devoted to formal student presentation; the remaining time was a discussion period during which emphasis was placed on identifying questions that remained unanswered, and areas where further research and interdisciplinary approaches were needed.

It was the instructor's feeling that the subject matter was covered much more extensively than would have been possible under the lecture method. The use of this innovative approach resulted in the introduction of newer and relevant material, especially from interdisciplinary fields. Occasionally, certain intricate details on which the instructor might have spent time were avoided, but it was concluded that this was not detrimental to the overall approach.

Student reaction to this type of curricular planning was far more favorable than anticipated; the students responded enthusiastically to the challenge of this new kind of responsibility, and there was a much higher degree of student activity and participation than had been the case when the course was taught in the conventional way. The students particularly liked the opportunity to advance their own ideas and to focus their attention on future problems and developments in the field rather than dwelling on the accomplishments of former investigators which the students often considered to be overstressed in their courses. Since this method has proven so effective in this course, it is planned to give students similar opportunities in other courses.

For further information contact: Dr. Noland VanDemark, Chairman, Department of Dairy Science, 116 Plumb Hall, 625 Stadium Drive, The Ohio State University, Columbus, Ohio 43210.

DESIGN

Independent Study Units for Learning
After-Image Color Perception

Independent study units devised in the Department of Design at the University of Minnesota enable students to learn to perceive: (1) color after-glow (or "after-image"--perceiving the opposite of a color first observed, e.g., the after-glow sensation of vivid red is a light bluish-green); and (2) the related phenomenon of simultaneous contrast--the apparent change of adjacent colors produced by their interaction in our perception. Adjacent colors seem to add their after-images to each other; thus the viewer "sees" more color than is physically present.

Four units using standardized colored papers (based on National Bureau of Standards colors), selected references, and self-explanatory instructional booklets, presented in specially lighted carrels, require the student to generate, identify, match, record and chart their perceptual experiences in a carefully developed pedagogical sequence. Use of these units in 1972-73 indicates both learning effectiveness and student acceptance. Collected data have provided a means for studying the variability among individual skill development and the differences among the individual hue circles which each student is required to make for himself. Revisions and expansion of these units are being made on the basis of the data.

These units are used in the laboratory section of the foundation course of sequences for interior design and general design majors. Undergraduate and graduate students from design, home economics, art education, architecture and other related areas have started using the units voluntarily as a learning resource.

For further information contact: Marian Ortolf Bagley, Department of Design, University of Minnesota, St. Paul, Minnesota 55101.

EDUCATION

A Mastery Learning Course

One of the sharpest challenges to the "weeding out" effects of traditional education has come in recent years from advocates of mastery learning. Their position is that the grade of A as an index of mastery of a subject can, given sufficient time and appropriate types of help, be achieved by a high percentage of the students in a class. The essential conditions for mastery, they maintain, are (1) realistic performance criteria developed for a particular course and (2) procedures designed to enable most students to attain them.

An Education course on theory and methods of testing is soon to be presented for the seventh time at The University of Chicago under mastery learning terms. Leading attributes of the particular approach to mastery learning used in this course include: (1) the aim of achieving mastery levels within the regular term of the course; (2) preservation of a previously established in-class mode of instruction--in this case, lecturing; (3) the collection of diagnostic-progress evidence during the course to pinpoint the learning needs of individual students; (4) provision for corrective work outside the classroom time; and (5) the development of a final assignment or achievement test, setting tasks whose successful performance fully represents the learning objectives of the course.

A key to the mastery-learning model is the use of the diagnostic-progress evidence as information on the effectiveness of instruction, not as a basis for grades. For successful operation of the model, both the instructor and the students must act on this evidence. In this course, the instructor maintains flexibility in his lecturing, making such changes as each year's returns appear to demand. The students in the course make their response by undertaking corrective work generally in small out-of-class groups, thereby supporting the claim that the model, by assuring the allocation of grades by achievement alone rather than by quota, tends to nullify the competitive relationship that typically exists among students. Since the reform was instituted in the course, an average of 73 percent have received the grade of A.

For further information contact: Benjamin S. Bloom, School of Education, The University of Chicago, Chicago, Illinois 60637.

Project RELATE: Interdisciplinary Instruction in Language Arts Teaching

Project RELATE is an embryonic teacher education program designed to instruct elementary education majors in the teaching of reading and other language arts. It is now in its second year of implementation. One unusual feature of the project is its interdisciplinary nature, drawing upon the department of Elementary Education, Reading, Urban and Overseas English, Educational Psychology, Speech and Hearing, Audio-Visual Center, Radio and Television Services and Office for Academic Affairs. Also noteworthy is the fact that a variety of innovative strategies have been introduced, e.g., "hands on" field experience in elementary schools early in the student's program, and new techniques for student self-evaluation.

Much of the instruction is "mediated" through slides, tapes, transparencies, films and a series of fifty videotapes which document unrehearsed events in an elementary classroom.

Instructionally, the project is unusual in that a careful study was made of the students before the courses were first offered. Also, an analysis of the performance of highly competent teachers led to a design for the program which placed emphasis upon the students' ability to emulate professional practice to a high degree and to continue their professional growth beyond graduation.

At this point in the development of RELATE, Unit I print materials have been to press, Units II and III are on the threshold of being printed now, Unit IV is under review by the development team, Units V, VI, and VII are in the final writing stages, and the remaining units will be written during the spring semester, 1973. In the meantime, all materials (including earlier drafts) are in use with students under the close supervision of the team. Reports from the field indicate that students are acquiring the desired competencies much more rapidly than in previous semesters. This is particularly noticeable when the latest, most refined materials are put into service.

For further information contact: Dr. Jerome C. Harste or Dr. Anabel Newman (co-directors), Division of Teacher Education, School of Education, Indiana University, Bloomington, Indiana 47401.

Self-Instructional Units on Evaluation and Research

A series of self-instructional units on practical topics in evaluation and research have been produced for use in individualized instruction programs in the School of Education at Northwestern University. The project was initiated because of a perceived need for basic information to be used by evaluators on small and medium sized projects of all kinds. Because the evaluation needs on such projects are usually not too esoteric, self-instructional help on very practical topics appears to be a reasonable approach.

Eleven basic instructional systems in evaluation and research have been developed using a tape/slide presentation format. These units are as follows:

1. Surveys, data collection, and sampling
2. Experiments: testing a statistical hypothesis
3. Avoiding common errors in evaluation and research
4. Questionnaire construction
5. Selecting and using standardized tests
6. Technical issues in testing
7. Data collection by interview
8. Data presentation techniques
9. A layman's introduction to computer application
10. Hints for project evaluators
11. Specifying behavioral objectives

The technique of instruction is designed for individual use and maximum flexibility. The slide projector and tape recorder operate independently of each other and each can be controlled by the user. Thus, the user can take notes as long as he wishes, or hear the audio presentation more than once. The units are self contained and independent of one another. A user can select each individual unit in a sequence to suit his own needs.

When the user has completed any one presentation and reviewed his notes, a mastery test is available for administration and scoring. A success criterion of a minimum mastery of 85% of the items must be demonstrated before the user is judged to have mastered the unit. A feedback mechanism is available in the units where incorrect answers are keyed to sections of well known books and articles in the field of evaluation and research.

These units are being used at Northwestern University in a basic graduate course on research, Introduction to Research. In addition, units are made available for continuing education programs for staff members at cooperating elementary and secondary schools. These units are available nationally to selected users through the Center for the Teaching Professions at Northwestern University.

For further information contact: Dean B. J. Chandler, School of Education, Northwestern University, Evanston, Illinois 60201.

Teacher Training Centers

Northwestern University's School of Education, with the cooperation of schools in the Chicago area, has created six Teacher Training Centers to provide clinical experiences for students in the teacher education program of the School of Education. Each of these Centers has entered into a memorandum of agreement with the faculty of the School of Education to provide Northwestern's prospective teachers with specific clinical experiences; that is, work with children and youth in various subject fields at each school. Each cooperating school has agreed to provide in-depth experiences only for those students now in the teacher education program at Northwestern. The faculty of the Teacher Training Center Schools will assign grades for the classroom performance of the Northwestern students, thus eliminating on-site judgments by School of Education professors. The schools involved in the new arrangement can be compared to teaching hospitals where Medical School interns are assigned for specialized training under the supervision of competent professionals.

The Tutorial-Clinical Program provides for the content of lesson plans to be discussed on campus in a tutorial setting, while the actual preparation of the plan is done in a clinical classroom setting under the direction of a teacher at one of the six Teacher Training Centers.

The memoranda of agreements which have been entered into with the six schools represent a further refinement of the Tutorial-Clinical Program in teacher education which was reported here in 1967 (CIC Report #3, p.9). The development of partnerships with schools for teacher preparation goes far beyond the traditional practice of placing students in schools for student teaching. The partnership represents a dual commitment: the schools involved work closely with Northwestern and no other university in providing clinical experiences and in supervising those clinical experiences for education students; at the same time, Northwestern faculty are involved in these schools in various capacities, and other resources of the University and the School of Education have been made available to the cooperating schools.

For further information contact: Dean B. J. Chandler, School of Education, Northwestern University, Evanston, Illinois 60201.

ENGINEERING

Student-Paced Learning in a Test-Based, Multi-Media Laboratory

The multi-media instructional laboratory in electrical engineering establishes a central role for the course textbook and builds from the text as a base. (The rationale is that the students will continue to be text-dependent for much of their later learning and will therefore benefit from the special skills involved.) In part because of the technical nature of the subject matter, the course designers have assumed that students will have many educational needs which "software" cannot anticipate, so the laboratory is always staffed by two persons competent and current in the subject(s) under study. The laboratory represents one form of the course, which enrolling students may select at the start of the semester; students who prefer may instead enroll in a traditional form of the same course.

Students who elect the individualized, multi-media course are guided in their studies by a set of specifically stated performance objectives (e.g., determine the Thévenin equivalent circuit of a one-port network). In addition to the course text, they use audio-tapes, brief video tapes, work exercises, and sample (or practice) self-tests. These media and materials, as well as the consultants, are available 63 hours per week in a specially but modestly outfitted instructional laboratory.

Two introductory courses in electrical engineering are currently provided in the laboratory and a third will soon be added. In addition, engineering honors students are enrolled; they complete their course within 12 weeks, leaving three weeks for additional or "enrichment" instruction. The total enrollment for the courses averages approximately 200. Satisfaction with the individualized, multi-media courses is high, both for students and instructors. The laboratory serves about 50% of the students enrolled in the two courses and, of these, about 70% receive A's or B's, while less than 20% fail to complete the course satisfactorily.

For further information contact: Professor William H. Hayt, Jr. or Walter L. Weeks, School of Electrical Engineering, E. E. Building, Purdue University, West Lafayette, Indiana 47907.

The Professional Development Degree

The Professional Development Degree idea began some 3-1/2 years ago. The concept, evolved in Extension Engineering, aimed at creating a new, unique postgraduate degree opportunity for adult working engineers. This degree program is specifically oriented to engineers holding full-time jobs. It allows engineers to stay essentially fully active in their daily work, to blend their practical experience with study and yet be enrolled in an individually tailored course of study with an achievement goal in sight--the P.D. Degree. The program is open to any engineer as candidate who has already earned at least a Bachelor's degree in Engineering or a Science degree from an accredited program; it is not a degree between the Bachelor's and the Master's, nor a degree to replace another.

To earn the P.D. Degree, an engineer must compile a minimum of 1200 credit hours of study in his program (roughly equivalent to 25 undergraduate college credits). Credit hours are made available to the candidate from all types of continuing education programs, including: institutes of two or three days (engineering, management, etc.); short courses; evening courses; seminars, conferences and workshops; correspondence study; guided independent study projects; and remote instruction via network media--many of which have been labeled "non-credit" in the past. A maximum of seven years is allowed to complete the credit hours requirement, but the degree will not be granted within three years of a candidate's most recently earned degree.

The guidelines stress a balance of program time between different elements of study: (1) Technical Updating--reviews and refreshers (MAX - 20% of total); (2) Technical Advancement--new technology developments (MIN - 30%); (3) Professional Electives--supplementary technical managerial topics (About 30%); (4) Outside Interest Electives--humanities, cultural (About 20%). It is required that at least 1000 of the earned credit hours be evaluated by exam or report writing; not more than 200 hours of study or participation in programs may be credited without evaluation.

There are two other significant points about the program. Most of the credit hours are expected to be earned through University of Wisconsin studies and its programs. However, up to one-half (600 hours) of the total required are permitted to be earned and transferred from courses and studies undertaken elsewhere. Transfer credits must be from accredited or documented programs acceptable to the degree administration and must be earned within the 7-year maximum program span allowed. Secondly, an Independent Special Study Project is required for a candidate's program. About 200 credit hours are recommended to be earned thus. It should be a project of some worth, but there is wide latitude of choice. An on-the-job project with outside study is often ideally suited. Submission of a project report for faculty review is required as evidence of independent capability. Usually such a project will fall in the area of Technical Advancement or Professional Elective.

The P.D. Degree program is administered jointly by a committee of faculty from both the College of Engineering, UW-Madison and the Department of Engineering, UW-Extension. Counseling of candidates about their programs is under the direction of faculty advisors, and records/transcripts of progress are maintained by Extension.

For further information contact: Dr. John P. Klus, Chairman, Department of Engineering, 432 North Lake Street, University of Wisconsin-Extension, Madison, Wisconsin 53706.

LANGUAGE

CAI in Latin

The Department of the Classics at the University of Illinois has developed several programs for computer-assisted instruction for use in Latin classes, using the PLATO (Programmed Logic for Automatic Teaching Operations) system. A high-speed digital computer is the central control element for teaching a number of students simultaneously, while allowing each student to proceed independently through the lesson material. Each student station has an electronic keyset for communicating with the central computer and a display unit for viewing information selected by the computer. The programming language (TUTOR) has been developed locally.

In beginning Latin classes conceptual explanations are presented in class; drill and practice are done in the laboratory. Another program offers practice in Latin composition by combining a conference course with a variety of laboratory exercises. Acceleration and independent study are possible in both of these courses. A third program accompanies an undergraduate course in Vergil's Aeneid. This program assists the student by allowing him to check his understanding of and clear up any difficulties with the surface meaning of the text, and it assists the instructor by permitting direct movement to more significant points.

Some special strengths of this system which are particularly appealing in FL instruction include: individualization of student work; voluntary or automatic branching to remedial or advanced material; immediate reinforcement for correct answers and varied kinds of assistance for mistakes; availability of random-access 35mm color slides and audio; and, availability of student data summaries in various formats.

Findings with CAI in these programs are very encouraging: grades seem to be higher than in conventionally taught sections; student work at PLATO terminals tends to be

intense and efficient; outside preparation time is reduced; class size is less important provided the student spends sufficient time at a PLATO station; and, student reaction has been very favorable.

For further information contact: Richard T. Scanlan, Associate Professor, Classics, University of Illinois, Urbana, Illinois 61801.

Evaluation of Self-Paced Instruction in German

The German instructional program using Deutsch (context-oriented grammar and reader) as a basis, utilizes in a systematically developed pedagogical sequence the computer, programmed workbooks, television programs, audio tapes and visual sequences to organize the "learning phase" for the student. Examinations constructed to assess skills of reading, comprehension, speaking and writing are also part of the program. The original experimental program was described in 1966 in CIC Report #2 (p.8), and the program as it existed in 1972 was described in Report #8 (p.16).

Research and development groups have assisted the German Department faculty to analyze the theoretical and applied questions related to teaching and learning effectiveness, student acceptance, and costs of the total program and each of its components. On the basis of these efforts to date we can make the following statements.

There are two necessary conditions for using (decoding and encoding) the German language: an adequate vocabulary for the semantic goals of discourse and a complete set of the grammatical algorithms of the language. These two conditions must be met by the students; a teacher cannot "teach" them; mastery of vocabulary and grammar are the students' obligation. These are the learning phase, as opposed to the teaching phase.

The contribution which the teacher makes is to organize the material logically, economically and meaningfully. For the grammar this implies the use of post-Bloomfieldian linguistics and, in particular, the insights of transformational grammar. For the vocabulary this implies maximum use of context-oriented utterance strings. This "teaching phase" must be done in the classroom or in small-group instruction. The latter is preferable, since it provides for the possibility of individualized instruction. For a student who has advanced to an equivalent level of the learning phase, a sequence of computer, workbook, visual, television and small group instruction, designed to allow the student to complete anything from one to fifteen credits a quarter, based on individualized instruction, can be offered.

Grammatical algorithms and vocabulary matrices are necessary conditions for using the language, but they are not sufficient conditions. The complex process of actual

decoding and encoding is hardly understood at all. No programmed systems can adequately exploit this phase which must be done beyond the limits of finite programs, in human interchange. The following statements can, however, be made:

1) The German grammar and grammatical sequence have been empirically verified as a viable programmed instructional sequence.

2) The computer as an instructional device is being tentatively verified empirically as to its viability, and it elicits a very positive response from the students.

3) Television has been verified as a device for increasing by small but measurable amounts the capacity of the student to encode and decode spoken German language strings.

4) The instructional sequence program is well enough articulated to admit examining its individual parts to determine the viability of each part and to permit the construction of experiments (which are currently being conducted) to determine the relative effectiveness of each part.

5) We have the apparatus to verify our tentative assumption that this kind of instruction is logistically viable in two respects: it can ultimately reduce and control the costs of instruction if extended to a large student body; it increases student learning by measurable amounts and increases student interest.

For further information contact: Professor Cecil Wood, Department of German, University of Minnesota, Minneapolis, Minnesota 55455.

MATHEMATICS

Drill and Practice Individualization by CAI for Algebra

In the Mathematics Department at the University of Minnesota two programs have been developed for computer assisted tutorials in college algebra. One concerns the quadratic formula, and the other concerns several types of elementary linear equation problems. In both of these programs problems are generated in a random fashion and the student is asked to respond via a teletype console.

In the event of an incorrect answer, the programs attempt to analyze the nature of the error on a basis of the most likely error analysis. Responses by the computer take the form "I think you forgot to divide by 2A" in the quadratic equation program.

If no error can be determined, then the program attempts to interrogate the student about his work. As a last resort, the program presents the student with a detailed solution. If the student persists in making mistakes which neither he nor the program can find, the program suggests that he should take the computer printout and consult further with his instructor.

It is well known that many elementary algebra students require extensive practice and instruction to master algebraic manipulations. This approach allows the computer to fill these needs and frees the instructor to deal with the students' conceptual difficulties. New mathematical concepts are introduced through the more traditional techniques of lecture and text. The computer assists by providing the drill and practice necessary for learning.

These programs are currently being used by the University and several other schools in an attempt to evaluate their effectiveness and student and faculty acceptance. Attitudinal data indicates a favorable reaction by students to this approach to instruction. On the basis of initial data the department is proceeding to develop several additional programs similar in approach.

For further information contact: Professor Howard Jenkins, Department of Mathematics, University of Minnesota, Minneapolis, Minnesota 55455.

MICROBIOLOGY

"Microbiology--What Is It?": A Slide and Film Presentation

An experimental mixed-media production entitled "Microbiology - What Is It?" has been developed by the Department of Microbiology and the teaching aids laboratory of The Ohio State University. The intents of the project are: to introduce the subject of microbiology to viewers with little prior knowledge of the science; to create an awareness of the vast scope of involvement of microorganisms with everyday life; to point out the relevance of the science to society; and to stimulate a general interest in microbiology.

The production is a 30-minute, 3-screen show which includes 750 35mm slides in addition to 16mm film footage and a stereo sound track. Presentation requires programmed projection from 6 35mm slide projectors and a 16mm film projector.

The production was recently presented as an introduction to our beginning students in general microbiology courses. The group comprised students intending to major in microbiology as well as students who were taking the course either for general interest

or as a requirement for their major program in an allied science such as nursing, medical technology, etc. Of the 524 student respondents to a survey concerning the mixed-media production, 447 indicated that the presentation stimulated their interest in studying microbiology and only 66 indicated that it did not. Slightly less than half the group (228 of 505) said that the presentation introduced them to topic areas studied by microbiologists with which they were previously unfamiliar. The subjects mentioned most frequently by the students were: ecology-water pollution, foods, virology, pathogenic microbiology and cell biology, in that order. As anticipated, those who had already chosen microbiology as a major were more familiar with subject areas involving microbiology than were the non-majors.

In response to a question asking if they enjoyed the presentation, 521 said yes and 3 said no. Many indicated they would like to see it again. We expect to use the production for teaching again during Spring Quarter and to follow up the student responses.

For further information contact: Patrick R. Dugan, Chairman, College of Biological Sciences, The Ohio State University, 484 West 12th Avenue, Columbus, Ohio 43210.

PHYSICAL THERAPY

Media-Based Instructional Variations

In January, 1972, a project entitled "Development of a Systematic, Media-Oriented Course in Kinesiology" was initiated in the Physical Therapy Education Program, University of Iowa. The systematic approach used consisted of course unit breakdown, writing behavioral objectives, development of appropriate visuals, "teaching-learning" method, and an effective system of course evaluation and student examination.

Thus far, over 300 anatomical drawings and overhead transparencies and 2400 slides have been produced. The "teaching-learning" method allows large group instruction, small group interaction, and student self-study. There is a structured system of student input in the development and evaluation of this project.

For further information contact: Roger C. Skovly, M.A., L.P.T., Instructor, Physical Therapy Education Program, Oakdale Hospital, Oakdale, Iowa 52319.

POLITICAL SCIENCE

Field Participation in Campaign Politics

The Department of Political Science offers a special program in which students may earn academic credit while working in political campaigns. The purpose of the program is to combine participant observation as an active member of a candidate's campaign staff with academic study of the literature on political campaigns, public opinion, and voting behavior. Students review relevant published material, attend seminars conducted by faculty members and campaign organizers, and serve on the staff of a candidate for office until election day. After the election students meet in evaluation, discussion and review sessions in which campaign experiences are analyzed in light of the academic literature. The final product of the course is an extensive research paper in which hypotheses about campaign activities and electoral behavior are tested.

The program consists of a minimum package of 15 hours of course work which each student participating in the program must take. Five hours of regular course credit with a letter grade are given for taking one of four regularly scheduled Political Science courses. The other ten credit hours are earned in two special courses:

1) Political Science 593--Five hours of credit graded S/U are given for participation in the first week of intensive lectures, seminars, etc., for passing an exam on the literature assigned over the summer, and for performing satisfactory work for a candidate in the campaign. The first week of training begins two days before the start of regularly scheduled classes, and involves over 50 hours of work to be completed by the end of the week. Submission of a short paper predicting the outcome of the election and developing some hypotheses about it is required.

2) Political Science 594--Five hours of credit with a letter grade are given for participation in the post-election seminars and for writing an extensive research paper. The early seminars are devoted to a review of the elections and to the roles of the students in them. Faculty members and campaign personnel share in analyzing the election results. A research paper 20 to 30 pages in length, devoted to testing hypotheses generated prior to the election, is required. Some of the later seminars are devoted to mutual evaluation and criticism of the research papers.

Students may schedule more than the mandatory fifteen hours, but should recognize that the requirements of the Campaign Politics program are quite demanding in themselves.

For further information contact: B. James Kweder, Political Science Department, 202C Derby Hall, 154 N. Oval Drive, The Ohio State University, Columbus, Ohio 43210.

Small-Group Teaching of Social Science Research Methods

Social Science majors at Michigan State University are required to take a sequence of courses in research methodology, a requirement which many students regard as superfluous and unusually demanding. The generally negative attitude toward this sequence tends to bring out the worst in student behavior patterns, e.g., excessive preoccupation with grades and attempts to "beat the system." The problem is compounded by the personalization and passivity brought about by the size of the class and dependence on the familiar lecture, text, and test instructional model.

In order to address this complex set of problems, the teaching of methodology in political science research methods was restructured in an effort to allow students greater freedom and responsibility for their own learning. The reorganization had four objectives:

1. Create a community of workers instead of a passive audience.
   It was hoped that passivity would be decreased radically by student participation in genuine research projects of real scientific significance.

2. Create a "team" organization to reduce personal isolation and increase social responsibility.
   Students were assigned to teams, matched with respect to GPA and interests, to perform research projects. The hope was that peer group interaction and coordination of expertise would increase student involvement. Grades would be based on the "team" project and an individual final examination.

3. Confront the "teams" with legitimate research problems which could be solved only if team members acquired the necessary intellectual tools.
   The purpose of this task assignment was to generate strong motivation to acquire the concepts and problem solving "set" required for research, and to demonstrate that knowledge is not a "given," but the product of social process.

4. Provide for greater interpersonal contact between students and faculty and provide more efficient utilization of faculty time.
   It was felt that utilizing faculty and GTA advisors for each "team" would facilitate this objective.

The first year of this project was essentially exploratory. The results of this phase showed both the problems and potential of the new teaching method. The following year several changes were made in the course structure and an experimental control group comparison was made.

Analysis of this experimental comparison was conducted the third year of project development. The results of this analysis were, for the most part, discouraging. The major effect hypothesized was an interaction between course structure and student motivation, attitude, and achievement. However, the changes in course structure did not seem to result in significant differences in motivation or achievement, when examining group means. But when students were partitioned into subgroups, it became apparent that variance was increased in the experimental group, that some students were "turned on" and did better, while others were "turned off" and did worse.

The future of the innovations developed in this proje t is uncertain. The cost of implementing this instructional model is high, and the method seems potent only with certain types of students. It may be that many of today's students are not ready for small group, inductive, student-directed methodology, and that a single exposure to such a methodology in 16 years of education is an inconclusive test.

For further information contact: Dr. Frank A. Pinner, 321 South Kedzie Hall, Michigan State University, East Lansing, Michigan 48823.

PSYCHOLOGY

A Seminar on Teaching

A seminar designed to give graduate students training in the art of teaching undergraduate courses was conducted by Psychology faculty at The University of Iowa during the summer of 1971. Each student lectured four times before an undergraduate course in Introduction to Social Psychology and was observed by his fellow graduate students and the professors. The undergraduate students taking the course rated each graduate student lecturer on structured rating scales and open-ended items. These ratings were compared with similar ratings given by students when the course was taught by a seasoned professor. While the comparison showed that on most scales the overall teaching quality was weaker for the course taught by the group of graduate students, this loss of quality was not severe, and was considered by those supervising the training program a small price to pay for the benefits derived for the graduate students themselves.

During the meetings of the teaching seminar, the members gave constructive feedback to the lecturer, studied topics such as test reliability, and discussed broad issues in the philosophy of education. The teaching seminar was carefully evaluated (again with rating scales and open-ended items) to provide the faculty with positive measures of the results of their team-taught training program in teaching skills. The graduate

students felt that the experience was very valuable in the development of their teaching skills. They also offered some suggestions for future improvement, including the use of video tape recordings in feedback, and comment about lecturing styles and tactics.

For further information contact: Robert S. Baron and Nicholas B. Cottrell, Department of Psychology, University of Iowa, Iowa City, Iowa 52242.

Sliding Point, Contract Teaching in Psychology

The Department of Psychology at The University of Iowa had considerable success with a summer class of 34 students enrolled in Elementary Psychology. The course plan was based on previously published research on contingency managed classroom techniques. This is basically a contract method in which the course material is divided into small units to be completed by the student in sequence at his own rate. Each student receives immediate feedback and those who do poorly are given personal attention and the opportunity to retake a different test on the same unit.

Previous research had shown that slow starters in such programs correlated highly with lower grades. To overcome this problem, the staff incorporated a sliding scale bonus system in which bonus points were given to those who completed work at an early date. The department maintained a conventionally taught course to provide a basis of control and comparison, especially upon final examination.

The results were encouraging. All students completed enough points and did well enough on the final examination to receive an A in the course. There was definite correlation between the fast starting student and the late starting student. Those who responded with an initial high rate of productivity earned more points per unit and tended to complete more units than required for the course. Of more than 500 unit quizzes, only 9% were failed.

Extensive use of graduate proctors, individual attention, immediate feedback, and clearly delineated expectations contributed to the success of this teaching program. Since studies show that students with an initial high rate of productivity outperform slower starters, even in conventionally taught courses, the sliding point scale system used in this experiment should be of interest to instructors in all course programs.

For further information contact: John F. Knutson, Department of Psychology, The University of Iowa, Iowa City, Iowa 52242.

Student-Generated Multi-Media Instructional Units

In the Autumn Quarter of 1972 a 35-member class of Introductory Psychology students undertook a conversion of the basic categories of psychology into a multi-media presentation for other introductory psychology students. The idea was originated by five members of the class, and approved by a majority of the class. The class selected a steering committee of four, which then divided the remainder of the class into eight groups, and assigned each group one of the major areas of psychology (Psychology as a Science, Development, Perception and Awareness, Learning and Thinking, Motivation, Personality, Mental Health and Disorders, and Social Psychology) presented in their text. Each group was to research its topic in the text and related sources, to identify basic concepts, and to locate appropriate visuals, either in color slide or super-8 movie form. Thematic unity of the many categories and concepts was achieved by the use of two characters--Freud and his patient, played by two members of the class--who appeared on super-8 film in connection with each area. A sound track was developed to enhance the impact of the presentation.

The final product comprised 500 slides and 250 feet of movie film, and lasted about 15 minutes. It was presented on five screens: numbers one, three and five showed color slides; screens two and four had movie film. The presentation was shown to four other introductory psychology sections, and to faculty, staff and administration. The reaction of participants and viewers was very favorable: participants felt they had learned a great deal about psychology and about interaction with others, and appreciated the opportunity to apply what they had learned to something meaningful and relevant; viewers were impressed with the amount of material covered in such a short time and with the creativity behind the filming.

Ten students from that class refined the production for presentation to Winter Quarter Introductory sections, and to test it out on some High School classes. Pre- and post-tests are being developed to determine what specific types of learnings result from the presentation.

For further information contact: Ruth Scott, Psychology Department, The Ohio State University - Newark Campus, Newark, Ohio 43055.

Undergraduate Participation in Setting Objectives and Evaluating Products

Enrollment in the undergraduate elective course Psychology 446, "Adult Learning in the Natural Setting," ranges between 75 and 100. The overall theme is the application of findings from psychological and educational research to different instructional settings, e.g., high school, college, industry, government, community, etc. Rather than specifying a finite list of course objectives, the instructor marks out boundaries and each student selects a particular area of educational activity within these limits about which he/she feels a genuine concern, such as educational reform in prisons or the "open" college classroom. Thus, the first assignment for each student is to specify objectives which will establish the personal relevance of the course.

One of the three class hours each week belongs to the teacher--lecture, course management decisions, etc.; one hour is a large-group discussion period. For the third hour students meet in small peer-led interest groups to arrange visits to high schools, prisons, industry, etc.; to discuss features of a particular instructional site; to pool references and resource information, and so on.

All the students are required to write five papers as the main output of the course (no exams). These successive reports amount to a personal manual in which each student "bridges" the theory from the lectures and assigned reading materials with the concrete procedures in the instructional setting he/she has selected for in-depth analysis.

The papers are read and evaluated by classmates on a volunteer basis, and at least 90% of the students serve as Readers for one or more sets of papers. Small reading groups of from three to five students are formed, each group receives five to ten papers of a given assignment, and the instructor conducts a briefing session to clarify the main criteria for evaluation. The instructor assumes responsibility for assigning grades, leaving the Readers free to evaluate the quality of the Writer's presentation. This detailed analysis has been well received and is a successful instructional procedure. Since the graduate student teaching assistant is no longer necessary in this course, Psychology 446 is cost effective but without sacrificing the interests of the individual student.

For further information contact: Stanford C. Ericksen, Department of Psychology, The University of Michigan, Ann Arbor, Michigan 48104.

STATISTICS

Auto-Tutorial Teaching Method

An auto-tutorial format, as an alternative method in teaching statistics to social science majors, proved to be equal or superior to the traditional lecture-lab method. Not only was there improved student performance as compared to a traditionally taught course, but also students expressed a definite preference for the auto-tutorial method of teaching.

Since previous experience indicated that regular lectures generally imparted redundant material and restricted the opportunity for students to ask specific questions, the course involved no formal classroom lectures. Instead the student worked through a specially prepared text-lab manual designed to guide him through computational procedures immediately after a presentation of the theoretical rationale for various statistical procedures. Students were allowed to work at their own speed and at times of their own choosing; more capable students could complete a semester's work in less than a semester's time. The auto-tutorial format offered each student immediate attention for his specific problems and questions.

Because of the emphasis upon independent study and a wide choice of lab hours, students were denied much of the feeling of "engagement" experienced with the traditional lecture and through classroom communication between students. To ameliorate this "affect" problem, lab hours were restricted in order to increase congestion in the lab and to encourage students to work on problems jointly. This increased interaction helped some students to verbalize their questions, and encouraged them to discuss their problems with their lab instructors.

For further information contact: Dr. Frank J. Kohout, Department of Sociology, The University of Iowa, Iowa City, Iowa 52242.

II. University-Wide Activities

Open University by Radio

It has been known for some time that much college-level instruction could be accommodated within, or adapted to, the conditions of radio. Beginning in 1969, University credit courses have been broadcast by Purdue's AM radio station, WBAA. The move was prompted by several factors: desire to enlarge students' access to education; faculty interest in exploring additional ways of teaching; attractiveness of production and delivery costs with radio; and the radio station's desire to be of more direct service to the educational community. The service has been continued and expanded since 1969. To date, 17 different courses have been developed, tape recorded, and broadcast, several recurringly. More than 6,000 students have monitored these courses and 1,261 have established University credit through examinations that accompany the courses.

Radio-enrolled students monitor the broadcasts on their own schedule (they may also review lesson tapes at the University's Audio-Visual Center), and they may obtain course materials at nominal cost. When they decide to take the final examination--to establish course credit--they complete a simplified formal registration and, if not already a full-time student, pay a $25.00 examination fee. It comes as no surprise that the course performance of radio-enrolled students, who are typically somewhat above the average of students at the outset, remains above the average of classroom peers.

In the past, approximately three out of every four radio course enrollees have been regular University students; however, this is at least partly because of the broadcast scheduling of the courses. They have been aired in evening hours when WBAA broadcasts with reduced power and with effective coverage only in the immediate community. Now, courses are also being broadcast during daytime hours, when the potential audience is greatly increased, and on Sundays, when more people are free from work. In addition, courses from the series are being aired, for credit, by both Ball State and Vincennes University and, not for credit, by the Oregon Educational Broadcasting network.

For further information contact: Richard O. Forsythe, Director of the Instructional Division, WBAA, Elliott Hall, Purdue University, West Lafayette, Indiana 47907.

Skills for the Beginning Teacher

As a result of concern for providing better quality instruction on the Indiana University Bloomington campus, the Associate Instructor Teaching Skills Program (AITSP) has been established. The program is designed primarily fo graduate students who have undergraduate teaching responsibilities but who have had no formal teacher education. Currently, the AITSP is working with six departments; next fall the faculty of the program will also be offering a campus-wide graduate seminar on college teaching.

The basic assumptions of the AITSP are: (1) beginning college instructors need to understand the nature of learning and instruction within a theoretical framework; and (2) the graduate student Associate Instructors (A.I.'s) need an opportunity to practice new techniques and skills in a realistic setting where they can receive analysis and feedback on their teaching behavior. Hence, there are two major components of the program: First, weekly seminars are held in which issues such as teacher/student roles, motivation, testing procedures, communication and group dynamics are explored. Second, practical teaching experiences are provided in videotaped microteaching situations where the A.I.'s learn particular teaching behaviors such as question asking, stimulus variation, communication skills, etc. Supervised analysis and feedback is provided during these sessions. One phase of the teaching practicum experience involves observational analysis of A.I.'s teaching in their own classrooms.

Information from early evaluations of the program is being used for continual change and improvement. Some of the more conclusive findings are as follows:

(1) The program is viewed by A.I.'s as a valuable experience fulfilling the need they have to know more about teaching.

(2) The A.I.'s with the least amount of prior teaching experience demonstrate the most dramatic change in teaching behaviors.

(3) The program should be offered as a course with graduate credit as a viable part of the curriculum.

(4) The program should concentrate on teaching behavior that is appropriate to the discipline involved, but with the emphasis clearly placed on relevant aspects of teaching, not on learning new content or information in the discipline.

For further information contact: Dr. Kenneth Majer, Director, AITSP, Maxwell Hall, Indiana University, Bloomington, Indiana 47401.

INTERDISCIPLINARY PROGRAMS AND COURSES

Residential College for Community Studies

In the Fall Quarter of 1972, Northwestern University introduced into the curriculum at the undergraduate level five residential colleges, two of which are thematic in content. One of the thematic colleges, The College of Community Studies, has taken an approach to education which not only attempts to provide educational alternatives for individual choice by students, but also conceptualizes the use of educational resources far beyond those normally available on campus. The curriculum represents a one- to three-year experience which augments the existing curricula at Northwestern and which involves an integration of field work in the city of Chicago and surrounding communities with classroom study. Approximately one hundred students were admitted to the College of Community Studies for the 1972-73 academic year; the experiences of the College have thus far proved to be quite successful.

The College of Community Studies is characterized by its dedication to the goal of integration--in the broadest sense of the term. The program is intended to integrate: 1) the functions of teaching, research and public service; 2) the various disciplines, as they relate to the theme of community studies; 3) students with different academic majors and backgrounds; 4) action and reflection, i.e., field and classroom study; 5) living and learning experiences; and 6) faculty and students in their attempts to study problems of mutual concern. The major thrust of the College is to attain, on the part of both student and faculty participants, an enriched sense of how knowledge is organized in the various disciplines, and how its application to solving community problems emerges from those disciplines. The theme of community studies is defined to include the study of human collectives ranging from small face-to-face groups to large scale political subdivisions, i.e., metropolitan areas.

Five core courses are offered in The College of Community Studies. The major curriculum contribution of the College is a course called "The Dynamics of Planned Change," which is taken by each member of the College. It meets for the full year and involves both student and faculty participants who make up the membership of the College. Four additional core courses represent adaptations of existing offerings in four University schools and departments: education, journalism, political science, and sociology. The core courses in 1972 were: "The School and Society"; "News Media and Society"; "Community Political Processes"; and "The City: Urbanization and Urbanism." These five courses are supplemented by additional seminars offered by faculty associates from related departments and by student organized seminars. Independent study and supervised full- or part-time field study are also sponsored by the faculty in a number of departments.

The academic program has built-in self-renewal features in that: (1) the four departmental core courses will be revised each year; (2) each year, one or more of the participating departments may be replaced by other departments; (3) the Faculty Associate seminars will be selected anew every quarter; and (4) provision is made for student involvement in decisions about the College program, thus insuring a flow of fresh ideas. An additional incentive for program innovation is that the College will augment, but not replace, existing academic majors in the University. The program thus is free of the responsibility to establish a comprehensive sequence of courses, and hence can be more flexible in its offerings, and more sensitive to student needs for self-designed learning experiences.

For further information contact: Professor David C. Epperson, The College of Community Studies, 2303 Sheridan Road, Northwestern University, Evanston, Illinois 60201.

PROGRAMS OF STUDY FOR THE INDIVIDUAL STUDENT

Human Potential: A Residential Seminar on Personal Development

Few would disagree that a large component of a student's college education occurs outside the conventional classroom. In order to facilitate this aspect of the educational process at Michigan State University, East McDonel Residence Hall provides a series of seminars emphasizing human potential for its residents. The purpose of these small group experiences is to facilitate student growth and maturation through self-examination and awareness of a broad range of personal goals, strengths, achievements, and value systems. The seminars are intended to induce constructive self-evaluation, with the ultimate goals of greater self-determination, self-motivation, and an increase in self-confidence.

The basic format of the seminars was developed at Kendall College, Evanston, Illinois, and involves a group of six to eight participants with a trained resident advisor in interaction for approximately 20 hours. The role of group leader is difficult and demanding. Steps toward preparation for this role were summarized in CIC Report #8 (1972, p.33). In the first phase, each person in the group is encouraged, by the leader's example, to share those experiences which he feels have contributed to his being the person he is now. After this personal unfoldment phase comes the goal setting process, which is continued throughout the seminar. Initially, each person sets a goal to be achieved by the next meeting. Goals must meet certain stringent criteria such as: achievable, believable, measurable, non-injurious, voluntary, etc. The next phase deals with personal achievements, successes, satisfactions, and value

clarification focusing on identification of personal motivational principles and clarification of what is important to a person. The final session emphasizes long-range goal setting or life-style planning.

The general response by students to the Human Potential Seminar experience has been very positive and encouraged continuation of the program. On an evaluation inventory developed for this project, students showed major gains in the areas of value recognition and goal setting and indicated great satisfaction with this particular strategy of becoming involved in their own education.

For further information contact: Miss Carolyn Jakobsen, Head Resident Advisor, East McDonel Hall, Michigan State University, East Lansing, Michigan 48823.

Individual Plans of Study for the B.A. or B.S. Degree

The Individual Plans of Study program, an experiment in individually structured learning, began operation in September, 1971, in the College of Liberal Arts and Sciences. An IPS program supplants the conventional major and minor; the student must complete all other College and University degree requirements. The College confers either the Bachelor of Arts or the Bachelor of Science degree in Individual Plans of Study.

For admission to the program each student presents a proposal outlining the purpose and methods of his study and consults with a faculty member who will serve as his academic advisor. After the proposal and a letter of agreement from the advisor have been received, the IPS staff reviews the student's file, occasionally suggests revisions of the proposal, and makes admissions decisions.

The flexibility of the program enables students to pursue a wide variety of curricula in such relatively orthodox studies as photography and film, labor relations, and Asian Studies, and in more unorthodox studies such as ideas of power, prison reform, and urban planning journalism. Students in the program have conducted portions of their studies at universities and communities abroad, at other universities in the United States, and in work situations related to their plans of study; they are encouraged to explore different ways of learning and new relationships between established areas of knowledge.

For further information contact: Director, Individual Plans of Study, College of Liberal Arts and Sciences, University of Illinois, 408 South Goodwin, Room 220, Urbana, Illinois 61801.

* * *

The College of Arts and Sciences at Indiana University offers a somewhat similar program, called the "Independent Learning Program." For information contact: Dr. Richard Young, Independent Learning Program, Ballantine Hall, Room 129, Indiana University, Bloomington, Indiana 47401.

Man, Science and Society: An "Open" Seminar

A paramount concern of all incoming freshmen at the University of Wisconsin-Madison is a fear of being reduced to a mere number in the midst of thousands of other students. To change this situation, "Man, Science and Society" was conceived in 1969 as an undergraduate seminar. Students have the opportunity to meet in a weekly two-hour session with a distinguished UW faculty member in a small-group, give-and-take atmosphere. The professors involved donate their time to explore this new approach to improving the calibre of education for the students.

A student may select one of many different section topics to investigate with fifteen others in a one-semester course. Topics have included such things as: "The University as a Political Institution"; "De-Fusing the Population Bomb"; "The Literature of Freedom"; "Foods, Drugs, and the Consumer"; and, "The Computer and the Future." A dorm staff lounge, a student apartment, or a professor's home are some of the settings for the sessions.

Man, Science and Society is listed in the timetable under Contemporary Trends, but is open to students from all colleges. The two credits given for the course are counted as elective and not toward partial fulfillment of requirements within a specified major.

Enthusiasm for the student-initiated project has been most encouraging. In the spring of 1969, seven sessions were held. Now the total is twenty-five. The basic seminar structure allows both students and faculty to communicate knowledge; students are stimulated to develop skills of investigation; through systematic inquiry, they become aware of problems and alternatives; and they are encouraged to commit themselves to a position via class discussion.

For further information contact: Professor Charles Sherman, Communication Arts, The University of Wisconsin-Madison, Madison, Wisconsin 54306.

* * *

The Freshman Seminar Program at The University of Wisconsin-Milwaukee is similar in purpose, but is on a smaller scale. For information contact: Ronald H. Snyder, Assistant to the Dean, College of Letters and Science, The University of Wisconsin-Milwaukee, Milwaukee, Wisconsin 53211.

Problem-Focused Instruction and Student-Initiated Learning

All instruction at the University of Wisconsin - Green Bay is oriented toward problems rather than toward disciplines or strict subject matter areas, and UWGB emphasizes student involvement in instruction in a number of ways.

Special off-campus projects form an integral part of the sophomore and junior years for each student at the University of Wisconsin - Green Bay. Sophomores are enrolled in independent study programs examining, for instance, the unique problems of urban schools; organization of community based learning programs for Indian villages; or maintenance of water quality control in major regional industries. The junior year brings a one-month journey to study another culture and its means of solving problems comparable to those studied earlier in a domestic setting. Growth and development students investigate the movement toward schools for infants in London, for example, while science students examine environmental control in a city on the European continent.

In line with the focus on problem solving, students at UWGB accept responsibility for their own education. Every regularly enrolled student creates at the time of matriculation and maintains throughout his academic career a learning contract between himself and the institution. This document sets forth the student's promise to complete a specific program of study and the University's promise to award a degree for his accomplishment. Students identify their own academic program by choosing appropriate courses from the entire spectrum of university offerings and by petitioning for acceptance of these in their degree program. This procedure allows students to introduce components into the academic equation which suit their individual needs and preferences.

Another UWGB policy encourages students to design courses where nothing comparable is presently offered. A student who identifies an area of interest sufficient to attract a class of enrollees may draft a course description, suggest a qualified faculty member as teacher, assist with securing approval of the course, and help to recruit students. Many such courses are offered on a one-month basis during the January interim period, when innovation is especially welcome, or as summer school experimental courses. Eventually a number of these student-initiated courses will be refined and incorporated in the regular UWGB curriculum.

For further information contact: Dr. W. Werner Prange, Dean for Instructional Services, UWGB, Green Bay, Wisconsin 54302.

Student Involvement in Pilot Program

The Pilot Program at the University of Michigan, supported jointly by the College of Literature, Science and the Arts and the Housing Office, consists of approximately 575 first and second year undergraduates living in Alice Lloyd Hall. The students in the program generally take one or two 2-credit Pilot seminars per semester in addition to their regular courses in the College of LS&A.

The wide range of Pilot seminars are taught by graduate students who are resident teaching fellows in the program. Because the teachers live in the residence hall and interact with their students as friends and counselors as well as teachers, the traditional impersonal and hierarchical relationships between students and teachers is broken down; this new relationship leads to a classroom atmosphere more conducive to active student participation.

Because of the large turnover of students each year, most seminars for the Fall semester are initiated by the teaching fellows. However, 1/4 to 1/3 of the classes in the Winter semester are initiated by the students in the program through a "New Course Board" which is set up each Fall. If there is no resident fellow who is capable of teaching a particular student-proposed course, the program does have some funds for hiring a few suitable outside instructors.

In addition to student initiative and participation in the academic part of the program, there is also an attempt to involve students closely in the life of the residence hall and the overall administration of the program. At present there is a referendum system of government which allows students to propose referenda and vote on various aspects of the program, such as setting up of new facilities in the building, allocation of money for outside speakers, etc.

For further information contact: Pilot Program, Alice Lloyd Hall, 100 Observatory Street, The University of Michigan, Ann Arbor, Michigan 48104.

The Bachelor of General Studies Degree after Four Years

The Bachelor of General Studies degree program at The University of Michigan is a realignment of traditional course offerings to give a different accounting procedure for a liberal arts degree, rather than a specifically innovative approach to curriculum. Ideally, the B.G.S. degree allows a student who has given a great deal of thought to the direction of his or her education a chance to assume full responsibility for developing a course of study that fits his individual goals. In the 1970 CIC Report (#6, p.17) the rationale and requirements for the B.G.S. degree were summarized. At that time the program was just beginning, and it was not known how many or what sort of students it would attract.

At its outset, many viewed the B.G.S. degree with skepticism, and it was tagged as an unmarketable, "cop-out" degree. These attitudes have since softened and the degree program has progressed through stages of guarded optimism, expanding enrollment and finally growing confidence in the concept. Of nearly 12,000 undergraduates presently enrolled in the College of Literature, Science and the Arts, 800 juniors and seniors and 1,000 freshmen and sophomores were enrolled in the B.G.S. degree program by August 1972, and more than 325 students have graduated with the B.G.S. degree.

The B.G.S. degree program is not without its share of critics, but it appears from test data that the B.G.S. provides an important academic niche for capable, highly creative, intellectually oriented students who tend not to perform as well as one would judge from traditional criteria. Some of these students find in the rigor and demands of the introductory language course requirement for the Bachelor of Arts degree precisely those educational conditions which they are unable to tolerate, and for these students, the B.G.S. provides a satisfactory alternative.

In the view of the College, the B.G.S. program is a forward-looking degree program, subject to ongoing review and change, which has come to represent an important, positive option in the curriculum. (This report was abstracted from an article entitled "A Different Expression in Liberal Arts," in Compact, October, 1972, p. 12, by Dean C. Baker, Charles G. Morris, and David Rodgers.)

For further information contact: David Rodgers, Assistant to Assistant Dean, College of Literature, Science and the Arts, 1223 Angell Hall, The University of Michigan, Ann Arbor, Michigan 48104.

The Role of Students in the Residential College

Students have played a central role in the Residential College of The University of Michigan since the inception of that quasi-autonomous unit. The Residential College was designed to foster undergraduate growth, and to encourage undergraduate independence; for six years those objectives have been pursued, partly through active undergraduate participation in all spheres of College activity.

Specifically, students have been and remain active at three distinct levels of operation:

a) The governance of the College, at the highest level, rests in student hands to a significant degree. From the opening of the College, in the Fall of 1967, to December, 1972, the College was governed jointly by the Dean and a Representative Assembly consisting of eight elected student and eight elected faculty members. In January, 1973, that mode

was transformed into a Community Assembly of all students and faculty, each with one vote. This Assembly, like the Representative Assembly before it, makes the general policy within which the College operates--subject, of course, to the higher authority of the Regents of the University of Michigan, and the governing faculty of the college of LS&A, who review the Residential College from time to time.

b) Much of the day-to-day business of the Residential College is carried on by committees--on curriculum, educational policies, housing, finance, faculty evaluations, etc.--consisting of faculty and students, usually in equal number. Here student participation is concrete and highly instrumental. Personnel matters are handled by the Director of the Residential College, with the concurrence of an Executive Committee, which consists of elected student and faculty members.

c) Most important, the education of each student is largely directed by that student, with the guidance and support of counselors and instructors he is likely to know well. Courses specially devised for individuals, special programs of off-campus study, and individualized concentration programs, are all common in the R.C.

Ours is a student-centered college. Understandably, it meets with warm, enthusiastic support, both from its current and past students, and from its current and past faculty.

For further information contact: James H. Robertson, Director, Residential College, 139 Tyler, East Quadrangle, The University of Michigan, Ann Arbor, Michigan 48104.

Variable Credit Tutorial Course for Freshmen

LAS 110 is a variable-credit tutorial course for first-year students enrolled in Unit I, an experimental undergraduate program at the University of Illinois at Urbana-Champaign. The course allows freshmen to work closely with individual faculty members on an independent study basis for one semester or one year, and is intended to offer students a non-threatening and relatively unstructured opportunity to explore the resources of the university community, and, more particularly, of a discipline or field of study. The course is graded on a satisfactory/unsatisfactory basis; hours of credit rather than a letter grade reflect the quality and quantity of the work done. Students may enroll in LAS 110 each semester for up to four credit hours, and may add credits (up to four) or drop credits (down to one) any time during the first eight weeks of instruction; at the end of the semester, they may add or drop up to two credits. This flexibility is intended to permit ongoing evaluation of the student's participation, and to adjust credits to reflect performance realistically.

Students may select one or more tutorials described in a catalogue, or they may design their own tutorial and then seek an appropriate faculty instructor. In either case, student and tutor together work out details of instruction (meeting times, requirements, credit, and so on); the essential aspect of the course is this contract between student and tutor. At the end of the semester, student and tutor complete a description and evaluation form that is included in the student's academic folder, thus providing a detailed accounting of the LAS 110 experience that far excels the usual transcript notation.

Students have earned LAS 110 credit through a variety of projects. In cases where a group of students share a particular interest (ceramics, yoga, radio-TV announcing, Jewish history, modern dance) they have often designed a course of study and selected their own instructor. Students have also organized and financed field trips to study their LAS 110 topic, for example, trips to study a Chicano Cooperative College in Texas and urban problems in New York City.

Most students and tutors are overwhelmingly enthusiastic about LAS 110; it is one way to achieve satisfying and personal teaching/learning experiences within the framework of a large university. The course offers an alternative to traditional instruction which could be implemented (as a total program or as a series of course offerings) within the university at large.

For further information contact: Ms. Paula Treichler, Living and Learning Unit, Allen Hall, The University of Illinois, Urbana, Illinois 61801.

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IV. Content Analysis of Issues 1-8

"DEVELOPMENT AND EXPERIMENT" IN TEACHING AT THE BIG TEN UNIVERSITIES

Stanford C. Ericksen
The Center for Research on Learning and Teaching
The University of Michigan

The first eight reports comprise 241 abstracts, each summarizing explicit changes in instructional arrangements: the use of technological aids, interdisciplinary programs, modified classroom procedures, and so on. For the most part, the abstracts sample relatively formal, planned changes rather than describing the many personal adaptations between a teacher and his students. The reported projects and programs are a cross-section of the "public" instructional changes taking place in higher education.

The 241 abstracts were coded into the 46 different categories within the nine major groups listed in Table I. Since many instructional arrangements are multi-faceted, a total of 604 factors were identified in this content analysis. The most impressive finding, clearly shown in Table I, is the large number of different categories necessary to represent the specific changes being introduced in college classrooms. The four categories reported most frequently illustrate this diversity: "Self-paced study within a class" (N=34); "Videotapes" (N=32); "Audio instructional tapes" (N=30); "Living-learning settings" (N=29).

Table I

Basic Categories (N=46) for Coding (N=604*) All Abstracts (N=241)

	N	Percent of Codes
A. Computer		
1. Computer-data analysis	18	
2. Graphics	5	
3. Simulation and gaming	11	
4. Information retrieval	1	
5. Evaluation and feedback	15	
6. Test scoring	2	
Total	52	(8.61%)
B. Visual Aids		
7. Videotapes	32	
8. Slides	18	
9. Films	27	
10. Television	16	
Total	93	(15.40%)

*A given abstract may represent more than one code characteristic.

Table 1 (continued)

C. Audio Aids		
11.	Evaluations of student papers, etc.	3
12.	Instructional tapes (lecture, etc.)	30
13.	Radio	2
14.	Telephone network and two-way blackboard	9
	Total	44 (7.28%)
D. Multimedia		
15.	Multimedia center or general use of multimedia	16 (2.65%)
E. Instructional Rearrangements		
16.	Programmed learning	26
17.	Group dynamics	6
18.	Simulation and gaming	15
19.	Self-paced study within a class	34
20.	Independent study	7
21.	Outreach, field experience	24
22.	Remedial work	13
23.	Living-learning settings	29
24.	Tutoring (teacher-student)	3
	Total	157 (25.99%)
F. Testing		
25.	Testing	1
26.	Self-testing	4
27.	Testing for original answers	3
28.	Diagnostic testing	11
	Total	19 (3.15%)
G. Evaluation		
29.	Research on evaluation of student work	3
30.	Rating scales	6
31.	Evaluation of teachers	7
32.	Evaluation of courses	13
33.	Attitudes and values	6
34.	Pass-fail, non-punitive grading	2
	Total	37 (6.13%)

Table I (continued)

H. New Approaches to Course Content		
35. Redefining course objectives	23	
36. New approach to a subject	24	
37. "Broadening" courses for non-majors	8	
38. Interdisciplinary courses	21	
Total	76	(12.58%)
I. Others		
39. Teacher training	20	
40. Research on teaching	28	
41. Educational development funds	9	
42. Reduced costs (directly stated in abstract)	8	
43. Undergraduates as teachers	4	
44. Faculty values	4	
45. Changing role of the teacher	20	
46. Continuing education	17	
Total	110	(18.21%)

A. The Major Groups

About one-third of the codes cite the use of technological aids--computer, visual, audio, and multimedia devices (the first four groups in Table I). A careful reading of the abstracts shows that more often than not the teacher has used these aids to add new information resources for his students in order to increase the flexibility of the learning environment.

Most entries under "Instructional Rearrangements" are adaptations of behavioral technologies--programmed learning, sensitivity training, self-paced supervised study, simulation and gaming--plus tutoring, and the use of off-campus resources. In most instances the role of the teacher is modified from traditional, center-stage lecturing to facilitating, guiding, and managing the learning conditions for individual students.

Considering the emphasis traditionally placed on classroom testing, it is surprising that so few entries are concerned with this subject. Similarly, the number of items under "Evaluation" is limited, due, perhaps, to the controversy between graders and non-graders.

"New Approaches to Course Content" represents efforts by a teacher or a committee to make available a different emphasis on subject matter. In several projects, for example, the teacher's role shifts from lecturing to serving as the leader in small discussion groups, supervising field studies, managing laboratory arrangements, or involving

students in the instructional process. Other projects in this broad group show an effort to present material in more meaningful contexts (film as literature), or from a new point of view (women's or black studies). In some respects, this group could be the most significant subset since the basic purpose of these changes is to influence what a student learns and thus the knowledge and attitudes he carries away from a particular course of study.

The miscellaneous group, "Others," includes programs and studies that extend beyond a specific class. For example, a number of schools (or departments within a school) have introduced programs for the orientation and preparation of the beginning teacher--usually the graduate student teaching assistant.

All the groups and categories in Table I have elastic boundaries and reflect my subjective judgment. Regardless, however, of how the specific abstracts might have been reordered, it is clear that instructional innovation in large universities is a complex and multi-dimensional activity. There are clear implications here for the kinds of institutional support that must be made available to improve instruction in all curricular areas.

B. Level of Education

Instructional experimentation occurs at all levels, from freshmen to Ph.D. to students in professional schools. It was possible to identify the educational level in 191 abstracts: 71% of these involved undergraduate students; 7%, graduate students; and 21%, students in professional schools (where no distinction was made between undergraduate or graduate status). The chief importance of these data lies in showing that the entire educational program of these large institutions is constantly changing and developing.

C. Distribution by Discipline

In compiling Table II the different professional schools were combined with the discipline area most closely related, e.g., medicine, dentistry, and engineering with "science"; education and social work with "social science"; music and journalism with "humanities." Neither the similarities nor the differences between the entries in the three columns in the table are surprising; the differences within each of the areas, however, are greater than the differences between them. I would like to interpret these results as indicating that teachers introduce whatever change seems most compatible with the instructional objectives they are trying to achieve.

Table II

Distribution by Discipline

Group	Science and Sci. Professions		Social Science and Soc. Sci. Professions		Humanities and Hum. Professions	
Computer	24	12.8%	8	5.3%	4	3.8%
Visual Aids	40	21.3	28	18.7	15	14.4
Audio Aids	19	10.1	10	6.7	10	9.6
Multimedia	5	2.7	2	1.3	3	2.9
Instructional Rearrangements	31	16.5	40	26.7	22	21.2
Testing	7	3.7	5	3.3	5	4.8
Evaluation	6	3.2	6	4.0	5	4.8
New Approaches to Course Content	33	17.5	37	24.7	27	26.0
Others	23	12.2	14	9.3	13	12.5
	188		150		104	

D. University-wide Activities

Reports No. 3-8 included abstracts about university-wide programs cutting across departments. About one-fourth of all the abstracts fit this category. Table III shows the distribution of university-wide activities with respect to the groupings given in Table I. Approximately half the items fall into the last two groups--"New Approaches to Course Content" and "Others." These projects usually involve a large number of students and teachers and considerable use of institutional resources for their development. (See page 64 for Table III.)

E. Class Size

Seventy-two percent (72%) of the abstracts indicated some basis for judging class size, and two-thirds of these involved classes of more than 100 students. In these large classes, visual devices are mentioned most often (25%) with "Instructional Rearrangements" and "New Approaches to Course Content" next most often (both 20%). The most frequently reported innovation in small classes is some form of "Instructional Rearrangement."

Table III

Distribution by University-wide Activities

Group	N	%
Computer	15	9.6
Visual Aids	10	6.4
Audio Aids	6	3.8
Multimedia	4	2.5
Instructional Rearrangements	22	14.0
Testing	3	1.9
Evaluation	17	10.8
New Approaches to Course Content	36	22.9
Others	44	28.0

F. Trends

No significant trends can be noted over the time period covered by these eight reports. The taxonomy used in making this content analysis inevitably blurs many of the distinctions that might be significant. For example, computer technology to support instruction is now being used differently than it was in 1966. Television has also changed quite dramatically as a result of VTR developments. Our data do not answer a second important question: Is instructional experimentation more prevalent now than it was in 1965-66?

G. The Current Issue - No. 9

The 38 abstracts in the current issue were judged as to how they would be distributed in Table I. There appear to be no significant changes from the basic pattern established in the distribution of abstracts in issues 1-8.

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A more complete report of the work of the CIC Panel on Research and Development of Instructional Resources, and of the analysis of these data, can be obtained from the author at 109 E. Madison Street, Ann Arbor, Michigan 48104.